

Perchlorate-tainted wells spur government action

The discovery in 1997 of perchlorate-contaminated drinking water in the western United States has spurred an interagency federal task force to tackle the health implications of this finding. The belief that perchlorate could be detrimental to humans at levels found in some sources throughout the United States is driving the action, but the work is challenging. In addition to the paucity of environmental fate and toxicity information on perchlorate, there is, as yet, no proven method for removing the compound from water.

Lawsuits have been filed in California, alleging that contaminated groundwater has created serious health risks for people living in the San Gabriel Valley, near Los Angeles. As a result, California's Public Utilities Commission is investigating whether water quality standards should change.

This month the federal task force, including representatives from EPA, the Agency for Toxic Substances Disease Registry, the National Institute of Environmental Health Sciences, the Department of Defense, and western states, is sponsoring a workshop to present results of ongoing research.

At relatively high doses, perchlorate is known to interfere with the thyroid's ability to produce hormones and regulate metabolism. Perchlorate has been detected at low levels in groundwater and surface waters throughout California, in the Colorado River, and in Lake Mead. Nev. Munitions facilities are thought to be the principal source of contamination. Perchlorate, an oxidizer and primary ingredient for solid rocket fuel, has a limited shelf life, and must be washed out of and replaced in the country's missile and rocket inventory.

A preliminary database search by EPA and the Metropolitan Water District of Southern California produced a list of 26 facilities in 14 states where perchlorate may have seeped into nearby ground or surface waters. The largest surface water concentrations to date, up to 1700 ppb, have been found in a Lake Mead inlet. In California, over 20 drinking water wells



Perchlorate, a primary ingredient in solid rocket fuel, must be regularly replaced in the nation's missile and rocket inventory. It is a contaminant in groundwater and surface waters in 14 states. (Courtesy NASA)

have been voluntarily closed.

Low levels of perchlorate in water were first detected in February 1997 in Sacramento, Calif., near an Aerojet General Corp. facility where solid rocket motors were tested. This finding attracted the attention of the California Department of Health Services, which also found contamination throughout the state: 30% of 232 groundwater wells tested were contaminated with perchlorate. CDHS, together with the California Environmental Protection Agency, set a provisional action level of 18 ppb and advised water utilities to remove from service sources contaminated above this level.

However, California's action level is based on an EPA reference dose founded on "highly uncertain data," admitted EPA toxicologist Annie Jarabek. To obtain reliable risk data, EPA is quickly reassessing the toxicity of perchlorate, and has compressed the typical five- to seven-year timetable for assessments to just under a year. The final assessment is expected in September.

The raw data are being developed under a \$2.2 million toxicity testing program, funded by the Defense Department and a coalition of perchlorate manufacturers and users. "We are extremely concerned about this issue," said Dan Rogers, an environmental lawyer at Wright Patterson Air

Force Base who has spearheaded the toxicity testing program.

Conventional water treatment practices, including ion exchange and advanced oxidation, have limited or no effect on low concentrations of perchlorate. However, many scientists believe that biological treatment methods hold the answer. "Biological treatment is the most promising technology we currently have to treat this chemical," said Bruce Logan, an environmental engineer at The Pennsylvania State University. Logan's preliminary laboratory results demonstrate that perchlorate levels can be reduced to below 18 ppb using a sand column impregnated with bacteria, he said. Several companies, including Aerojet, and the U.S. Air Force, are working to develop biological treatment processes.

A significant barrier to the use of any biological method is that such techniques have never been used in the United States, said Michael Osinski, in EPA's Office of Water. An additional \$2 million provided by Congress is aimed at finding a technology that will work.

Although there are no federal regulations for perchlorate, EPA signaled that it may be a candidate for regulation when it published the Drinking Water Contaminant Candidate List in March. —REBECCA RENNER